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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/822,374

04/12/2004

Shuichi Ohkubo

NEC WNZ-2665

2825

27667 7590 08/08/2007  
HAYES SOLOWAY P.C.  
3450 E. SUNRISE DRIVE, SUITE 140  
TUCSON, AZ 85718

EXAMINER

DANIELSEN, NATHAN ANDREW

ART UNIT

PAPER NUMBER

2627

MAIL DATE

DELIVERY MODE

08/08/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

**Application No.**

10/822,374

**Applicant(s)**

OHKUBO ET AL.

**Examiner**

Nathan Danielsen

**Art Unit**

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**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 16 May 2007.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1 and 3-11 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 and 3-11 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 04/09/07 & 06/16/07.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_.

### DETAILED ACTION

1. Claims 1 and 3-11 are pending. Claim 2 was canceled in applicant's amendment filed 16 May 2007.

#### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 3, 5, 6, and 8-11 are rejected under 35 U.S.C. 103(a) as being obvious over Fujiwara (US Patent Application Publication 2003/0002407).

Regarding claim 1, Fujiwara discloses a reproduced signal equalizing method for optical information media in which reproduced signals obtained by irradiating laser light to an optical information medium are equalized so as to bring a waveform thereof close to a waveform having a predetermined characteristic, the method comprising the steps of:

sampling reproduced signals in a predetermined cycle (§ 60);  
calculating an equalization coefficient for producing a smallest difference between a target waveform and an equalized waveform by the least square technique by using a predetermined number or more of sampled waveform data (§ 63); and  
equalizing reproduced signals by using the calculated equalization coefficient (§ 63).

However, Fujiwara fails to explicitly disclose the exact number of samples used but suggests in § 60 where the sampling frequency is significantly higher than a bit clock of the analog signal reproduced from the disc, as suggested by the use of the word "quantization" (to restrict [a variable quantity] to discrete values rather than to a continuous set of values<sup>1</sup>). Further, obtaining a specific number, or range

<sup>1</sup> quantization. (n.d.). Dictionary.com Unabridged (v 1.1). Retrieved August 02, 2007, from Dictionary.com website:

<http://dictionary.reference.com/browse/quantization>

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of numbers, of samples to use would then be considered a matter of routine experimentation based upon the well-known principles of statistics which suggest that a high number of samples would allow for the compensation for "outliers" (values far from most others in a set of data<sup>2</sup>). Additionally, the number of samples to be used in a digital system would be limited to a certain practical number such that the microprocessor chosen to perform the required calculations on the samples (chosen based at least on manufacturing costs and the speed at which it can properly operate) could actually perform the calculations with a minimum lag time between input and output so as to preserve the functionality of the device in which the microprocessor is embedded. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used any reason number of samples, as taught by Fujiwara, for the purpose of obtaining an adequately representative digital signal corresponding to an analog input signal ( 60 and MPEP § 2144.05(II)(A)).

Regarding claim 3, Fujiwara discloses where the method further comprises the step of:

inputting the reproduced signals sampled in the predetermined cycle to a Viterbi decoder (¶¶ 63);

and

defining said target waveform as a waveform based on binarized data demodulated by the Viterbi decoder and a partial response waveform (¶¶ 78).

Regarding claim 5, Fujiwara discloses an optical information reproducing apparatus having a function for equalizing reproduced signals by using a reproduced signals equalizing method according to claim 1 (figure 1).

Regarding claim 6, Fujiwara discloses where the method further comprises the steps of:

equalizing reproduced signals by using a reproduced signal equalizing method according to claim

1 (see above); and

evaluating quality of the reproduced signals from the equalized reproduced signals and binary identification data (¶¶s 108-110).

<sup>2</sup> outliers. (n.d.). The American Heritage® Dictionary of the English Language, Fourth Edition. Retrieved August 02, 2007, from Dictionary.com website: <http://dictionary.reference.com/browse/outliers>

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Regarding claims 8 and 10, Fujiwara discloses reproduced signal equalizing methods for optical information media in which reproduced signals obtained by irradiating laser light to an optical information medium are equalized so as to bring a waveform thereof close to a waveform having a predetermined characteristic, the method comprising the steps of, in order to read out information recorded on the optical information medium:

equalizing a predetermined number of samples of the reproduced signals by using a predetermined initial filter coefficient and generating a first equalized signal (§§s 74-77); identifying the first equalized signal by using a Viterbi decoder and obtaining a provisional identification result therefrom (§§s 78 and 79); generating a target signal from the provisional identification result and a predetermined partial response waveform (§§s 78 and 79); calculating a filter coefficient for producing a small difference between the target signal and the reproduced signals about the predetermined number of samples (§§s 78 and 79); equalizing the reproduced signals by using the calculated filter coefficient and generating a second equalized signal (§§s 78 and 79); and identifying the second equalized signal by using the Viterbi decoder (§§s 78 and 79).

However, Fujiwara fails to explicitly disclose the exact number of samples used but suggests in ¶ 60 where the sampling frequency is significantly higher than a bit clock of the analog signal reproduced from the disc, as explained in claim 1 above.

Regarding claims 9 and 11, Fujiwara discloses everything claimed, as applied to claims 1, 8, and 10, respectively. However, Fujiwara fails to explicitly disclose the number of samples of waveform data used but suggests in ¶ 60 where the sampling frequency is higher than a bit clock of the analog signal reproduced from the disc, as explained in claim 1 above.

4. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fujiwara, in view of Miyashita et al (US Patent Application Publication 2002/0064108; hereinafter Miyashita).

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Regarding claim 4, Fujiwara discloses everything claimed, as applied to claim 3. However, Fujiwara fails to disclose a specific partial response value.

In the same field of endeavor, Miyashita discloses where a partial response value (1,2,2,2,1) is used as the partial response waveform (§ 55).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the apparatus/method of Fujiwara with the functionality of the apparatus of Miyashita, for the purpose of correctly decoding data using the marks preceding and succeeding the shortest mark (§ 55).

5. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fujiwara, in view of Akiyama et al (US Patent Application Publication 20020067670; hereinafter Akiyama).

Regarding claim 7, Fujiwara discloses everything claimed, as applied to claim 6. However, Fujiwara fails to disclose a writing condition adjusting method, wherein a *recording condition* is adjusted based on an evaluation result of a signal quality evaluation method according to claim 6.

In the same field of endeavor, Akiyama discloses where a recording condition is adjusted based on an evaluation result of a signal quality evaluation method according to claim 6 (§ 47).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the apparatus/method of Fujiwara with the functionality of Akiyama, for the purpose of obtaining optimum recording/reproduction conditions (§ 47).

### ***Response to Arguments***

6. Applicant's arguments filed 16 May 2007 have been fully considered but they are not persuasive.

a. Regarding applicant's argument that "selecting the number of samples is far from obvious as demonstrated by Applicants' sworn specification which shows, unexpectedly, error rates stay essentially the same with 3000 or more sample", the examiner disagrees. As explained in claim 1, well-known principles of statistics state that a large number of samples would allow one to compensate for any outliers that may be present a set of sample. Applied to Fujiwara, this means

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that the quantization of the reproduced signal would require a significantly greater sampling frequency, and thus generate a large number of samples, in order to compensate for any samples that would contain a large amount of noise, thus making that particular sample an outlier. Further, it would then be expected of one of ordinary skill in the digital signal processing/signal equalization art to theoretically predict and experimentally determine what the optimum number of samples or range of numbers of samples would be that would result in the best functionality of the device being programmed to perform the signal equalization. See also MPEP §§ 2144.05(II)(A) and 2144.05(II)(B) in addition to ¶ 7 of US Patent Application Publication 2002/0131486 to Haartsen. Therefore, this rejection is still deemed proper and is maintained.

***Closing Remarks/Comments***

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nathan Danielsen whose telephone number is (571) 272-4248. The examiner can normally be reached on Monday-Friday, 9:00 AM - 5:00 PM Eastern Time.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William Korzuch can be reached on (571) 272-7589. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Nathan Danielsen  
08/02/2007

/William R. Korzuch/

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